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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of	:	Customer Number: 46320
	:	
Erik BURCKART, et al.	:	Confirmation Number: 9787
	:	
Application No.: 10/723,924	:	Group Art Unit: 2143
	:	
Filed: November 26, 2003	:	Examiner: D. Murray
	:	
For: EFFICIENT CONNECTION POOL VALIDATION	:	

**APPEAL BRIEF**

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This Appeal Brief is submitted in support of the Notice of Appeal filed December 7, 2007, wherein Appellants appeal from the Examiner's rejection of claims 1-24.

**I. REAL PARTY IN INTEREST**

This application is assigned to IBM Corporation by assignment recorded on July 13, 2004, at Reel 014846, Frame 0958.

**II. RELATED APPEALS AND INTERFERENCES**

Appellants are unaware of any related appeals and interferences.

### **III. STATUS OF CLAIMS**

Claims 1-24 are pending and two-times rejected in this Application. It is from the multiple rejections of claims 1-24 that this Appeal is taken.

### **IV. STATUS OF AMENDMENTS**

The claims have not been amended subsequent to the imposition of the Second and Final Office Action dated September 7, 2007 (hereinafter the Second Office Action).

### **V. SUMMARY OF CLAIMED SUBJECT MATTER**

1 Referring to Figure 1 and also to independent claim 1, a connection pool management  
2 system is disclosed. The system includes a connection pool 110 and a connection manager 130  
3 (lines 1-3 of paragraph [0017]). The connection pool 110 is configured to store a plurality of idle  
4 connections 120 (lines 1-2 of paragraph [0018]). The connection manager 130 is programmed  
5 for coupling to the connection pool 110 and further programmed to validate individual ones of  
6 the idle connections 120 by issuing a non-blocking input/output (I/O) operation 150 to each of  
7 the individual ones of the idle connections 120 (lines 1-4 of paragraph [0021]).

8 Referring to Figure 1 and 2 and also to independent claims 5 and 15, a connection pool  
9 management method (and computer program for causing a machine to execute the method) is  
10 disclosed. Responsive to adding a first one of a plurality of idle connections 120 to a connection  
11 pool 110, a global timestamp is recorded to indicate a time value when the first idle connection  
12 had been added to the connection pool (lines 8-9 of paragraph [0019]). Responsive to adding  
13 subsequent ones of the idle connections 120 to the connection pool 110, individual timestamps  
14 are recorded in the connection pool 110 in association with corresponding ones of the subsequent

1 ones of the idle connections 120 (lines 1-2 of paragraph [0019]). In block 230, a timestamp of an  
2 oldest one of the idle connections is compared to the global timestamp to determine whether a  
3 timeout condition has arisen (lines 4-7 of paragraph [0020]; lines 2-4 of paragraph [0023]). In  
4 block 280, responsive to determining that the timeout condition has arisen in, at least one of the  
5 idle connections is probed with a non-blocking input/output (I/O) request in order to validate the  
6 at least one of the idle connections (lines 1-4 of paragraph [0021]; lines 1-7 of paragraph [0023]).

## **VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

1. Claims 1-24 were rejected under 35 U.S.C. § 103 for obviousness based upon Batra, U.S. Patent No. 6,105,067, in view of Chintalapati et al., U.S. Patent Publication No. 2002/0156897 (hereinafter Chintalapati).

**VII. ARGUMENT**

**THE REJECTION OF CLAIMS 1-24 UNDER 35 U.S.C. § 103 FOR OBVIOUSNESS BASED  
UPON BATRA IN VIEW OF CHINTALAPATI**

For convenience of the Honorable Board in addressing the rejections, claims 2, 4-11, 13-21 and 23-24 stand or fall together with independent claim 1; and claims 12 and 22 stand or fall together with dependent claim 3.

**Claim 1**

On page 7 of the First Office Action, the Examiner admitted that the Examiner's primary reference of Batra fails to teach the following limitation:

a connection manager ... programmed to validate individual ones of said idle connections by issuing a non-blocking input/output (I/O) operation to each of said individual ones of said idle connections.

With regard to this limitation, the Examiner asserted the following in the paragraph spanning pages 7 and 8 of the Office Action:

In the same field- of endeavor, Chintalapati et al. discloses a mechanism for servicing connections by disassociating processing resources from idle connections and monitoring idle connections for activity wherein a poll adapter is able to use asynchronous (non-blocking input/output (I/O) operation) features of the operating system to monitor connections for activity. (paragraph [0023], paragraph [0024]).

Appellants note, however, that the teachings being relied upon Chintalapati do not teach the claimed limitations. Specifically, completely absent from the teachings of Chintalapati is the notion of validating an idle connection by issuing a non-blocking I/O operation to the idle connection. Instead, Chintalapati teaches polling connections to determine whether or not events are pending and whether or not a connection is active or remains idle. Moreover, Chintalapati

1 also describes closing connections that have been idle for a predetermined time period, which  
2 teaches away from the claimed invention.

3  
4 In response to the above arguments which were previously presented in the First  
5 Amendment dated May 29, 2007 (hereinafter the First Amendment), the Examiner asserted the  
6 following on page 11 of the Second Office Action:

7 The Examiner respectfully disagrees with Applicants argument that "validating a idle  
8 connection by issuing a non-blocking I/O operation to the idle connection" is completely absent  
9 for the teachings of Chintalapati et al. Batra in fact teaches the validation of a connection.  
10 Connections are periodically inspected and the elapsed time for the connection is compared to a  
11 maximum age value. If the elapsed time is larger the connection returned to the connection pool  
12 (column 12 lines 1-16). Chintalapati et al. teaches the use of asynchronous features of the  
13 operating system to monitor the connections for activity and determines whether or not the  
14 connection remains active or idle (i.e. ready for use)(paragraph [0017], paragraph [0018],  
15 paragraph [0023]). The feature of Chintalapati et al. relied upon is the use of asynchronous  
16 operations for the monitoring of connections and thus does not teach away from the claimed  
17 invention.  
18

19 Notwithstanding the Examiner's new reliance upon Batra to teach the claimed "validate  
20 individual ones of said idle connections," the Examiner's analysis ignores the claimed invention  
21 as a whole. In particular, the claimed invention essentially recites validation by issuing a non-  
22 blocking I/O operating. Thus, the claimed invention is directed to a particular technique for  
23 validation. Moreover, the Examiner's analysis has failed to set forth a proper claim construction  
24 for the term "validation."

25  
26 As the term "validate" is used consistent with Appellants' specification (e.g., see  
27 paragraph [0005]), a valid connection is one that is useable on demand, and to validate a  
28 connection is determine that the connection is useable. The teachings of Batra, however, are not  
29 directed to determining whether a particular connection is useable. Instead, Batra is directed to  
30 disconnecting connections that have been idle for too long (i.e., see column 11, lines 54-59).

1 The Examiner's new citation to column 12, lines 1-16 refers to situations in which after a  
2 determination is made that a servlet using the connection has crashed, the connection is returned  
3 to the pool. However, neither of these two approaches described by Batra determine whether a  
4 particular connection is useable. Thus, Batra fails to teach the limitations for which the  
5 Examiner is relying upon Batra to teach.

6  
7 As noted above, the claimed invention, as a whole, inextricably ties the performance of  
8 the validation with the particular technique used for validation. Thus, without a particular  
9 teaching that indicates to one having ordinary skill in the art that the particular claimed technique  
10 (i.e., issuing non-blocking I/O operation to idle connections) could be used for the claimed  
11 validation (i.e., determining whether the idle connection is usable), one having ordinary skill in  
12 the art would not have arrived at the claimed invention, as a whole. This would be true even if  
13 the applied prior art separately disclosed both the claimed technique and validation.

14  
15  
16 The Examiner further asserted the following in the first full paragraph on page 8 of the  
17 First Office Action:

18 Therefore it would have been obvious to a person of ordinary skill in the art at the time  
19 the invention was made to incorporate the teachings of Chintalapati et al. into the teachings of  
20 Batra in order to validate individual idle connections by issuing an asynchronous (non-blocking~  
21 operation. Such a feature would have made the overall system of Batra more efficient by not  
22 issuing blocking operations to idle connections that would waste resources in order to validate idle  
23 connections.  
24

25 The Examiner, however, has failed to supply any factual support for these assertions. Instead,  
26 the Examiner's asserted benefit (i.e., "would have made the overall system of Batra more  
27 efficient by not issuing blocking operations to idle connections") for the proposed modification is  
28 pulled directly from Appellants' disclosure and is completely absent for the teachings of the

1 applied prior art. It is well-established law that the "[d]etermination of obviousness cannot be  
2 based on the hindsight combination of components selectively culled from the prior art to fit the  
3 parameters of the patented invention."<sup>1</sup> Moreover, Appellants' disclosure is forbidden territory  
4 for the Examiner to obtain the requisite rationale for combining the applied prior art.<sup>2</sup> Thus,  
5 Appellants respectfully submit that the Examiner has failed to establish a prima facie case of  
6 obviousness in rejecting claim 1.

7  
8 In responding to the above argument, the Examiner asserted the following on page 12 of  
9 the Second Office Action:

10 In response to Applicant's argument that the examiner's conclusion of obviousness is  
11 based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness  
12 is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes  
13 into account only knowledge which was within the level of ordinary skill at the time the claimed  
14 invention was made, and does not include knowledge gleaned only from the applicant's disclosure,  
15 such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA  
16 1971).

17 While the motivation used by the Examiner does appear in the background of Applicant's  
18 disclosure it does not eliminate it as a valid motivation for combination as the claimed limitation  
19 would have been obvious because a particular known technique (in this case the use of non-  
20 blocking/asynchronous I/O operations in order to conserve resources) was recognized as part of  
21 the ordinary capabilities of one skilled in the art, this argument is moot however since the  
22 motivation does indeed appear in Chintalapati et al. (paragraph [0017], paragraph [0018]).  
23

24 At the outset, Appellants note that the Examiner's asserted benefit for the proposed  
25 modification (i.e., "would have made the overall system of Batra more efficient by not issuing  
26 blocking operations to idle connections that would waste resources in order to validate idle  
27 connections") is not disclosed by paragraphs [0017] and [0018]. Instead the Examiner's newly  
28 cited passages refers to improving efficiency by having each connection capable of being  
29 serviced by many worker threads. This teaching, however, is not comparable to increasing

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<sup>1</sup> *ATD Corp. v. Lydall, Inc.*, 159 F.3d 534, 546, 48 USPQ2d 1321, 1329 (Fed. Cir. 1998).

<sup>2</sup> *Panduit Corp. v. Dennison Mfg. Co.*, 774 F.2d 1082, 227 USPQ 337 (Fed. Cir. 1985).



1 efficiency "by not issuing blocking operations to idle connections that would waste resources in  
2 order to validate idle connections."

3  
4 Regarding the Examiner's citation that a conclusion of obviousness may be based upon  
5 "knowledge which was within the level of ordinary skill at the time the claimed invention was  
6 made," the Examiner has failed to factually establish that this knowledge was within the level of  
7 ordinary skill at the time of the invention.

8  
9 Claim 3

10 In the First Amendment, Appellants challenged the Examiner taking official notice of the  
11 fact that "it is notoriously well known in the art that idle connections could be stored in a data  
12 structure configuration for a last-in first-out (LIFO) ordering." Appellants also argued even if the  
13 Examiner can establish that the claimed missing elements are "well-known" in the art, the Examiner  
14 has still failed to establish a rationale for the modification.

15  
16 On pages 13 and 14 of the Second Office Action, the Examiner cited several references in  
17 support of the Examiner taking official notice. However, although these references describe  
18 using LIFO ordering for data structures, the Examiner has failed to establish that using LIFO  
19 ordering for "idle connections" is notoriously well-known. The Examiner also cited case law for  
20 the proposition that a conclusion of obviousness may be based upon "knowledge generally  
21 available to one of ordinary skill in the art." The Examiner's analysis, however, is incomplete.  
22 Specifically, the Examiner has failed to factually establish a common sense rationale (e.g.,  
23 knowledge generally available to one of ordinary skill in the art) that would have impelled one

1 having ordinary skill in the art to make the proposed modification. The Examiner cannot simply  
2 rely upon knowledge generally available to one of ordinary skill in the art and not explain what  
3 that knowledge is and factually establish that the knowledge is, indeed, generally available to one  
4 of ordinary skill in the art.

5  
6 Conclusion

7 Based upon the foregoing, Appellants respectfully submit that the Examiner's rejection  
8 under 35 U.S.C. § 103 based upon the applied prior art is not viable. Appellants, therefore,  
9 respectfully solicit the Honorable Board to reverse the Examiner's rejections under 35 U.S.C. § 103.

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To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due under 37 C.F.R. §§ 1.17, 41.20, and in connection with the filing of this paper, including extension of time fees, to Deposit Account 09-0461, and please credit any excess fees to such deposit account.

Date: February 7, 2008

Respectfully submitted,

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## **VIII. CLAIMS APPENDIX**

1. A connection pool management system comprising:  
a connection pool configured to store a plurality of idle connections; and,  
a connection manager programmed for coupling to said connection pool and further programmed to validate individual ones of said idle connections by issuing a non-blocking input/output (I/O) operation to each of said individual ones of said idle connections.
2. The system of claim 1, wherein said connection pool has an array configuration wherein each element in said array configuration comprises a timestamp data member and a reference to one of said idle connections.
3. The system of claim 1, wherein said connection pool comprises a configuration for a last-in first-out (LIFO) ordering of said idle connections.
4. The system of claim 1, wherein said connection pool comprises a configuration for storing a global timestamp indicating a time value when an oldest one of idle connections had been added to said connection pool.
5. A connection pool management method comprising the steps of:  
responsive to adding a first one of a plurality of idle connections to a connection pool, recording a global timestamp to indicate a time value when said first idle connection had been added to said connection pool;

responsive to adding subsequent ones of said idle connections to said connection pool, recording individual timestamps in said connection pool in association with corresponding ones of said subsequent ones of said idle connections;

comparing a timestamp of an oldest one of said idle connections to said global timestamp to determine whether a timeout condition has arisen; and,

responsive to determining that said timeout condition has arisen, probing at least one of said idle connections with a non-blocking input/output (I/O) request in order to validate said at least one of said idle connections.

6. The method of claim 5, wherein said comparing step comprises the step of comparing a timestamp associated with a least recently added connection in said connection pool to said global timestamp to determine whether said timeout condition has arisen.

7. The method of claim 5, wherein said comparing step comprises the steps of:  
summing said global timestamp and a pre-established timeout value;  
comparing said timestamp of said oldest one of said idle connections with said summed global timestamp and pre-established time out value; and,  
if said timestamp of said oldest one of said idle connections exceeds said summed global timestamp and pre-established timeout value, concluding that said timeout condition has arisen.

8. The method of claim 5, wherein said probing step comprises the steps of:  
sequentially performing timestamp comparisons with said global timestamp for each of said idle connections in said connection pool; and,

for each one of said idle connections having a timestamp which exceeds a combination of said global timestamp and a pre-established timeout value, attempting a non-blocking I/O operation over said one of said idle connections.

9. The method of claim 5, further comprising the step of updating said global timestamp with a new value subsequent to probing said at least one of said idle connections.

10. The method of claim 5, further comprising the step of provisioning a most recently used one of said idle connections responsive to a request to provision an idle connection in said connection pool.

11. The method of claim 10, wherein said provisioning step further comprises the steps of:

probing said provisioned idle connection with a non-blocking input/output (I/O) request in order to validate said provisioned idle connection; and,

where said provisioned idle connection fails to validate, removing said provisioned idle connection from said connection pool and provisioning another one of said idle connections.

12. The method of claim 5, further comprising the step of adding each of said idle connections to said connection pool in a last-in first-out (LIFO) manner.

13. The method of claim 12, wherein said adding step further comprises the step of recording a timestamp in said connection pool for each added one of said idle connections to indicate when said added one of said idle connections had been added to said connection pool.

14. The method of claim 5, further comprising the step of removing from said connection pool each said idle connection which fails validation in said probing step.

15. A machine readable storage having stored thereon a computer program for connection pool management, the computer program comprising a routine set of instructions which when executed by the machine cause the machine to perform the steps of:

responsive to adding a first one of a plurality of idle connections to a connection pool, recording a global timestamp to indicate a time value when said first idle connection had been added to said connection pool;

responsive to adding subsequent ones of said idle connections to said connection pool, recording individual timestamps in said connection pool in association with corresponding ones of said subsequent ones of said idle connections;

comparing a timestamp of an oldest one of said idle connections to said global timestamp to determine whether said timeout condition has arisen; and,

responsive to determining that a timeout condition has arisen, probing at least one of said idle connections with a non-blocking input/output (I/O) request in order to validate said at least one of said idle connections.

16. The machine readable storage of claim 15, wherein said comparing step comprises the step of comparing a timestamp associated with a least recently added connection in said connection pool to said global timestamp to determine whether said timeout condition has arisen.

17. The machine readable storage of claim 15, wherein said comparing step comprises the steps of:

summing said global timestamp and a pre-established timeout value;

comparing said timestamp of said oldest one of said idle connections with said summed global timestamp and pre-established time out value; and,

if said timestamp exceeds of said oldest one of said idle connections exceeds said summed global timestamp and pre-established timeout value, concluding that said timeout condition has arisen.

18. The machine readable storage of claim 15, wherein said probing step comprises the steps of:

sequentially performing timestamp comparisons with said global timestamp for each of said idle connections in said connection pool; and,

for each one of said idle connections having a timestamp which exceeds a combination of said global timestamp and a pre-established timeout value, attempting a non-blocking I/O operation over said one of said idle connections.



19. The machine readable storage of claim 15, further comprising the step of updating said global timestamp with a new value subsequent to probing said at least one of said idle connections.

20. The machine readable storage of claim 15, further comprising the step of provisioning a most recently used one of said idle connections responsive to a request to provision an idle connection in said connection pool.

21. The machine readable storage of claim 20, wherein said provisioning step further comprises the steps of:

probing said provisioned idle connection with a non-blocking input/output (I/O) request in order to validate said provisioned idle connection; and,

where said provisioned idle connection fails to validate, removing said provisioned idle connection from said connection pool and provisioning another one of said idle connections.

22. The machine readable storage of claim 15, further comprising the step of adding each of said idle connections to said connection pool in a last-in first-out (LIFO) manner.

23. The machine readable storage of claim 22, wherein said adding step further comprises the step of recording a timestamp in said connection pool for each added one of said idle connections to indicate when said added one of said idle connections had been added to said connection pool.

24. The machine readable storage of claim 15, further comprising the step of removing from said connection pool each said idle connection which fails validation in said probing step.

**IX. EVIDENCE APPENDIX**

No evidence submitted pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132 of this title or of any other evidence entered by the Examiner has been relied upon by Appellants in this Appeal, and thus no evidence is attached hereto.

**X. RELATED PROCEEDINGS APPENDIX**

Since Appellants are unaware of any related appeals and interferences, no decision rendered by a court or the Board is attached hereto.